## REMARKS

In the Final Office Action, the Examiner indicated that claims 1-28 are pending in the application and that claims 1-7, 13-16, and 20-23 are rejected. The Examiner objected to claims 8-12, 17-19, and 24-28. In view of the above amendments and the following discussion, the Applicants submit that none of the claims now pending in the application is anticipated or made obvious under the provisions of 35 U.S.C. § 102 and 35 U.S.C. § 103. Thus, the Applicants believe that all of these claims are now in allowable form.

### I. OBJECTIONS

The Examiner has objected to dependent claims 8-12, 17-19, and 24-28 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. Applicants thank the Examiner for indicating allowable subject matter, but believe independent claims 1, 13, and 20, from which these dependent claims depend, are allowable over the prior art of record for the reasons set forth below. Thus, Applicants contend that claims 8-12, 17-19, and 24-28 should distinguish over the prior art of record, since each claim depends from independent claims 1, 13, and 20. Therefore, Applicants respectfully request that the objection to claims 8-12, 17-19, and 24-28 be withdrawn.

### II. REJECTION OF CLAIMS UNDER 35 U.S.C. § 102

The Examiner has rejected claims 1-4, 8-10, 13, 14, 16, and 20-23 in the Office Action under U.S.C. § 102(b) as being anticipated by Franke et al., Autonomous Driving Goes Downtown, IEEE Intelligent Systems, 1998 (Franke).

Franke teaches a method of stereo based obstacle detection and tracking. Franke's approach estimates data points by fitting a rectangular box to a cluster of points on the depth map's extracted area. (See Franke, pg. 42, 1st col.)

The Examiner's attention is directed to the fact that Frankie fails to teach or to suggest a system and method of detecting an imminent collision comprising the steps of tessellating the depth map into a number of patches and selecting a plurality of

patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes, as positively claimed by the Applicants' independent claims. Specifically, Applicants' independent claims 1, 13 and 20 recite:

1. A method of detecting an imminent collision comprising the steps of:
producing from imagery a depth map of a scene proximate a platform;
detecting a potential threat in the depth map by tessellating the depth map into a number of patches and selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes;
estimating the size of the detected potential threat;
estimating the position of the detected potential threat;
estimating the velocity of the detected potential threat;
performing a trajectory analysis of the detected potential threat using the estimated position and the estimated velocity; and
performing a collision prediction based on the trajectory analysis. (Emphasis Added.)

13. A collision detection system, comprising:
a stereo camera pair for producing imagery of a scene;
a stereo image preprocessor for preprocessing said imagery;
a depth map generator for producing a depth map from said preprocessed imagery; and
a collision detector for tessellating the depth map into a number of patches, selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes and determining from said tessellated depth map and from said imagery if a collision is imminent;
wherein said collision detector detects a potential threat in said tessellated depth map;
wherein said collision detector estimates size, position, and velocity of said detected potential threat;
wherein said collision detector performs a trajectory analysis of said detected potential threat using said estimated position and said estimated velocity;
wherein said collision detector predicts a collision based on said trajectory analysis; and
wherein said collision detector determines if a collision is imminent based on said collision prediction and on said estimated size. (Emphasis Added.)

20. A computer readable medium having stored thereon a plurality of instructions, the plurality of instruction including instructions which, when executed by a processor causes the processor to perform the steps comprising:

producing from imagery a depth map of a scene proximate a platform;
detecting a potential threat in the depth map by tessellating the depth map into a number of patches and selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes;
estimating the size of the detected potential threat;
estimating the position of the detected potential threat;
estimating the velocity of the detected potential threat;
performing a trajectory analysis of the detected potential threat using the estimated position and the estimated velocity; and
performing a collision prediction based on the trajectory analysis.
(Emphasis Added.)

In one embodiment, Applicants' invention is a system and method of detecting an imminent collision comprising the steps of tessellating the depth map into a number of patches and selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes. After the data is tessellated into a grid of patches and a plane is fitted to each patch, each patch is then classified into predefined types based on 3D positions of each patch. (See Applicants' specification, para. [0030].)

Franke fails to teach, show or suggest tessellating the depth map into a number of patches and selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes. Franke only teaches estimating data points by fitting a rectangular box to a cluster of points on the depth map's extracted area. (See Franke, pg. 42, 1st col.) Thus, Franke fails to disclose or anticipate Applicants' invention of a system and method of detecting an imminent collision comprising the steps of tessellating the depth map into a number of patches and selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes.

Moreover, dependent claims 2-4, 8-10, 14, 16 and 21-23 depend, either directly or indirectly, from independent claims 1, 13 and 20 and recite additional limitations. As such, and for the exact same reason set forth above, the Applicants submit that claims 2-4, 8-10, 14, 16 and 21-23 are also patentable and not anticipated by Franke. As such, the Applicants respectfully request the rejection be withdrawn.

## III. REJECTION OF CLAIMS 6 AND 15 UNDER 35 U.S.C. § 103

The Examiner has rejected claims 6 and 15 as being unpatentable over Franke in view of Yang et al., Vision Based Real-time Obstacles Detection and Tracking for Autonomous Vehicle Guidance. Real-time Imaging VI, Proceedings of SPIE, Vol. 4666, pp. 65-74, 2002 (Yang).

The teachings of Franke are discussed above. Yang teaches vision-based real-time obstacles detection and tracking for autonomous vehicle guidance. Yang teaches a real-time hybrid obstacle detection method. (See Yang, Abstract.)

The Examiner's attention is directed to the fact that the combination of Franke and Yang, in any permissible combination, fail to teach, show or suggest the novel concept of a system and method of detecting an imminent collision comprising the steps of tessellating the depth map into a number of patches and selecting a plurality of patches for processing, wherein said processing comprises classifying the selected plurality of patches into a plurality of classes, as positively claimed by Applicants independent claims 1, 13 and 20. (See *supra*.)

Franke only teaches estimating data points by fitting a rectangular box to a cluster of points on the depth map's extracted area. (See Franke, pg. 42, 1st col.) Yang fails to bridge the substantial gap left by Franke. Yang only teaches a real-time hybrid obstacle detection method. (See Yang, Abstract.) Therefore, the combination of Franke and Yang does not teach, show or suggest Applicants' invention as recited in independent claims 1, 13 and 20.

Moreover, dependent claims 6 and 15 depend, either directly or indirectly from independent claims 1 and 13, respectively, and recite additional limitations. As such, and for the exact same reasons set forth above, the Applicants submit that claims 6 and 15 are also not obvious by the teachings of Franke and Yang. Therefore, the Applicants respectfully request the rejection be withdrawn.

## CONCLUSION

Thus, the Applicants submit that all of the above claims fully satisfy the requirements of 35 U.S.C. §102 and 35 U.S.C. §103. Consequently, the Applicants

believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly requested.

If, however, the Examiner believes that there are any unresolved issues requiring the issuance of a final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Robert M. Brush or Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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